



North Carolina Department of Health and Human Services  
Division of Public Health

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Date: 11 APR 2013  
To: NC Medical Providers  
From: Dr. Megan Davies, State Epidemiologist *MD Davies, MB*  
Subject: Diagnosis and Surveillance for Lyme disease

**Lyme Disease Introduction:**

Lyme disease (LD) is caused by infection with the bacteria *Borrelia burgdorferi* sensu stricto which is transmitted by the bite of an infected *Ixodes scapularis* tick. Clinical diagnosis for Lyme disease should be based on symptoms, physical findings and the possibility of exposure to infected ticks. The North Carolina Division of Public Health (DPH) would like to ensure that health care providers consider the possibility of LD in the appropriate clinical scenario and treat potential cases of LD early if the disease is suspected based on clinical findings. [1]

**Surveillance for Lyme Disease**

Per North Carolina law LD is reportable by health care providers, and isolation or identification of *B. burgdorferi* is reportable by laboratories. [2] Surveillance for LD is based on the standard case definition, which establishes uniform criteria for disease reporting in order to monitor trends, take action to reduce disease, and improve public health. [3] Surveillance case definitions are intentionally very specific and are used for national reporting and are not intended to be used in clinical diagnosis or patient care. For surveillance purposes, cases of LD are categorized and reported to CDC as confirmed or probable, depending on the symptoms, test results and patient history. Cases are reported based on county of residence which may not be the county where infection is acquired. A county is designated as endemic when two confirmed cases have been verified with appropriate travel history to indicate that infection was acquired within that county. During 2012, a total of 127 (33 confirmed, 94 probable) cases of Lyme disease were reported for NC. As of December 2012, three counties (Wake, Haywood and Guilford) are designated as endemic, **for surveillance purposes.**

**Serologic Testing for Lyme disease**

If LD is suspected in a patient, DPH requests that appropriate laboratory tests be ordered to support a surveillance diagnosis. Note that serologic testing is often too insensitive in the acute phase (the first two weeks) of infection and may be falsely negative. If laboratory testing is not supportive of a surveillance diagnosis, please consider reordering convalescent testing two weeks later. [4] All late manifestations of LD (musculoskeletal, cardiac, and nervous) must also be accompanied by appropriate laboratory testing to fulfill the case definition requirements. When ordering serologic tests be sure to request a total EIA (screening) test with an automatic reflex to IgG and IgM western blot if the EIA is positive or equivocal.

**Requirements to confirm (for surveillance) a case of LD based on county of residence & clinical presentation:**

	EM Rash $\geq$ 5 cm	Objective Late Manifestation(s)
Endemic County	Confirmed if known exposure occurred in a county endemic for LD	Laboratory evidence required for confirmation
Non Endemic County	Laboratory evidence required for confirmation	Laboratory evidence required for confirmation

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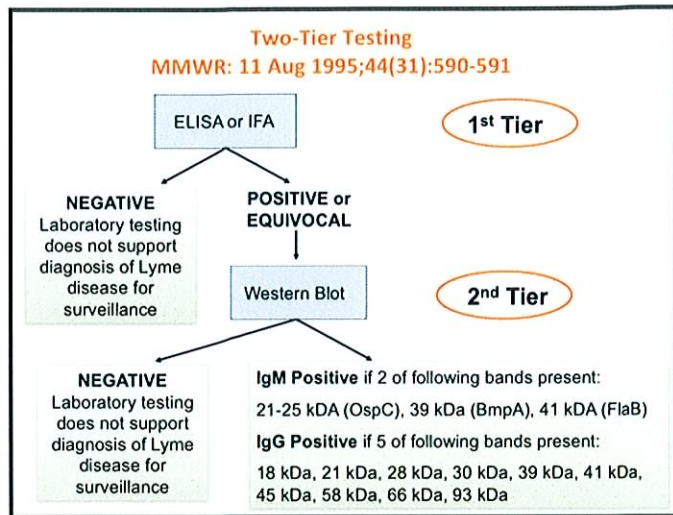
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**Laboratory criteria for confirmation includes:**

1. Positive Culture for *B. burgdorferi*, or
2. CSF antibody positive for *B. burgdorferi* by Enzyme Immunoassay (EIA) or Immunofluorescence Assay (IFA), when the titer is higher than it was in serum or
3. Two-tier testing interpreted using established criteria as shown



**Erythema Migrans Rash is Not Always Lyme disease**

In the southern United States it is recommended that EM rashes be treated as if early LD, regardless of what the true cause of the rash may be. [5] Early and appropriate antimicrobial therapy is essential to prevent disseminated or late manifestations of Lyme disease. STARI (southern tick associated rash illness) is a confounder for LD surveillance and is the primary reason that all cases of EM should be accompanied by laboratory evidence of infection to qualify as a case of LD for surveillance purposes. STARI most often follows the bite of the lone star tick (*A. americanum*), which is the most common tick in North Carolina and is not a known vector for *B. burgdorferi*.

**Education of patients, prevention of disease:**

We encourage all providers to educate their patients about personal protective measures they can take to minimize their risk of acquiring these conditions. Lyme disease prevention materials are available from the CDC.

Please contact Carl Williams or Jodi Reber at 919-733-3419 with any questions or concerns that you have regarding surveillance of Lyme disease. Your time and consideration on this topic are greatly appreciated.

**References:**

1. Wright, et. al. Diagnosis and Management of Lyme disease. Am Fam Physician. 2012 Jun 1;85(11):1086-93.
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3. <http://wwwn.cdc.gov/NNDSS/script/casedef.aspx?CondYrID=752&DatePub=1/1/2011>
4. Wormser, et. al. The Clinical Assessment, Treatment, and Prevention of Lyme Disease, Human Granulocytic Anaplasmosis, and Babesiosis: Clinical Practice Guidelines by the Infectious Diseases Society of America. CID. 2006 November 1;43:1089-1134
5. Blanton, et. al. Southern Tick Associated Rash Illness: Erythema Migrans is not always Lyme disease. Southern Medical Journal, 101(7), 2008, pp. 759-760